



DEPARTMENT OF ENERGY

[Case Number 2021-004; EERE-2021-BT-WAV-0009]

Energy Conservation Program: Notification of Petition for Waiver of GE Appliances, a Haier Company from the Department of Energy Miscellaneous Refrigeration Products Test Procedure and Notification of Denial of Interim Waiver

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notification of petition for waiver and denial of an interim waiver; request for comments.

SUMMARY: This notification announces receipt of and publishes a petition for waiver and interim waiver from GE Appliances, a Haier Company, which seeks a waiver for a specified miscellaneous refrigeration product basic model from the U.S. Department of Energy (“DOE”) test procedure used for determining the energy consumption of these products. This notice also announces that DOE is declining to grant the request for an interim waiver from the test procedure for the reasons described in this notification. DOE solicits comments, data, and information concerning the petition and its suggested alternate test procedure so as to inform DOE’s final decision on the waiver request.

DATES: Written comments and information are requested and will be accepted on or before [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at www.regulations.gov. Alternatively, interested persons may submit

comments, identified by docket number EERE-2021-BT-WAV-0009, by any of the following methods:

1. *Federal eRulemaking Portal*: www.regulations.gov. Follow the instructions for submitting comments.
2. *E-mail*: to AS_Waiver_Requests@ee.doe.gov. Include docket number EERE-2021-BT-WAV-0009 in the subject line of the message.

No telefacsimiles (“faxes”) will be accepted. For detailed instructions on submitting comments and additional information on this process, see the “**SUPPLEMENTARY INFORMATION**” section of this document.

Although DOE has routinely accepted public comment submissions through a variety of mechanisms, including postal mail and hand delivery/courier, the Department has found it necessary to make temporary modifications to the comment submission process in light of the ongoing COVID-19 pandemic. DOE is currently suspending receipt of public comments via postal mail and hand delivery/courier. If a commenter finds that this change poses an undue hardship, please contact Appliance Standards Program staff at (202) 586-1445 to discuss the need for alternative arrangements. Once the COVID-19 pandemic health emergency is resolved, DOE anticipates resuming all of its regular options for public comment submission, including postal mail and hand delivery/courier.

Docket: The docket, which includes *Federal Register* notices, comments, and other supporting documents/materials, is available for review at www.regulations.gov. All documents in the docket are listed in the www.regulations.gov index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

The docket web page can be found at www.regulations.gov/docket/EERE-2021-BT-WAV-0009.

The docket web page contains instruction on how to access all documents, including public comments, in the docket. See the “**SUPPLEMENTARY INFORMATION**” section for information on how to submit comments through www.regulations.gov.

FOR FURTHER INFORMATION CONTACT:

Ms. Lucy deButts, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, Mailstop EE-5B, 1000 Independence Avenue, SW., Washington, DC 20585-0121. E-mail: AS_Waiver_Request@ee.doe.gov.

Mr. Michael Kido, U.S. Department of Energy, Office of the General Counsel, Mail Stop GC-33, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0103. Telephone: (202) 586-8145. E-mail: Michael.Kido@hq.doe.gov.

SUPPLEMENTARY INFORMATION:

DOE is publishing GEA’s petition for waiver in its entirety, pursuant to 10 CFR 430.27(b)(1)(iv).¹ DOE invites all interested parties to submit in writing by [**INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***], comments and information on all aspects of the petition, including the alternate test procedure. Pursuant to 10 CFR 430.27(d), any person submitting written comments to DOE must also send a copy of such comments to the petitioner. The contact information for the petitioner is:

Bill A. Brown, GE Appliances, A Haier Company, Appliance Park – AP5-1S-86, Louisville, KY 40225. E-mail: b.brown@geappliances.com.

¹ The petition did not identify any of the information contained therein as confidential business information.

Submitting comments via www.regulations.gov. The *www.regulations.gov* web page will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. If this instruction is followed, persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to *www.regulations.gov* information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information (“CBI”)). Comments submitted through *www.regulations.gov* cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through *www.regulations.gov* before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable

for up to several weeks. Please keep the comment tracking number that *www.regulations.gov* provides after you have successfully uploaded your comment.

Submitting comments via email. Comments and documents submitted via email also will be posted to *www.regulations.gov*. If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. Faxes will not be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, written in English and free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public

disclosure should submit via email two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked “non-confidential” with the information believed to be confidential deleted. Submit these documents via email. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

It is DOE’s policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

I. Background and Authority

The Energy Policy and Conservation Act, as amended (“EPCA”),² authorizes the U.S. Department of Energy (“DOE”) to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part B³ of EPCA, Public Law 94-163 (42 U.S.C. 6291-6309, as codified), established the Energy Conservation Program for Consumer Products Other Than Automobiles, which, in addition to identifying particular types of consumer products and commercial equipment as covered under the statute, permits the Secretary of Energy to classify additional types of consumer products as covered products. (42 U.S.C. 6292(a)(20)) DOE added miscellaneous refrigeration products (“MREFs”) as covered products through a final determination of coverage published in the *Federal Register* on July 18, 2016 (the “July 2016 Final Rule”). 81 FR 46768 (July 18, 2016). *Id.*

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and

² All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Public Law 116-260 (Dec. 27, 2020).

³ For editorial reasons, upon codification in the U.S. Code, Part B was redesignated as Part A.

enforcement procedures. Relevant provisions of EPCA include definitions (42 U.S.C. 6291), test procedures (42 U.S.C. 6293), labeling provisions (42 U.S.C. 6294), energy conservation standards (42 U.S.C. 6295), and the authority to require information and reports from manufacturers (42 U.S.C. 6296).

The Federal testing requirements consist of test procedures that manufacturers of covered products must use as the basis for: (1) certifying to DOE that their products comply with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6295(s)), and (2) making representations about the efficiency of that product (42 U.S.C. 6293(c)). Similarly, DOE must use these test procedures to determine whether the covered product complies with relevant standards promulgated under EPCA. (42 U.S.C. 6295(s))

Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures DOE is required to follow when prescribing or amending test procedures for covered products. EPCA requires that any test procedures prescribed or amended under this section must be reasonably designed to produce test results which reflect the energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use and requires that test procedures not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

MREFs are consumer refrigeration products other than refrigerators, refrigerator-freezers, or freezers. These products include coolers and combination cooler refrigeration products. 10 CFR 430.2. A “cooler” is a cabinet, used with one or more doors, that has a source of refrigeration capable of operating on single-phase, alternating current and is capable of maintaining compartment temperatures either: (1) no lower than 39 °F (3.9 °C); or (2) in a range that extends no lower than 37 °F (2.8 °C) but at least as high as 60 °F (15.6 °C) as determined according to the applicable DOE test procedure. The test procedure for MREFs is contained in

the Code of Federal Regulations (“CFR”) at 10 CFR part 430, appendix A to subpart B of part 430—Uniform Test Method for Measuring the Energy Consumption of Refrigerators, Refrigerator-Freezers, and Miscellaneous Refrigeration Products (“Appendix A”).

Under 10 CFR 430.27, any interested person may submit a petition for waiver from DOE’s test procedure requirements. DOE will grant a waiver from the test procedure requirements if DOE determines either that the basic model for which the waiver was requested contains a design characteristic that prevents testing of the basic model according to the prescribed test procedures, or that the prescribed test procedures evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 430.27(f)(2). A petitioner must include in its petition any alternate test procedures known to the petitioner to evaluate the performance of the product type in a manner representative of the energy consumption characteristics of the basic model. 10 CFR 430.27(b)(1)(iii). DOE may grant the waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(f)(2).

As soon as practicable after the granting of any waiver, DOE will publish in the *Federal Register* a notice of proposed rulemaking to amend its regulations so as to eliminate any need for the continuation of such waiver. 10 CFR 430.27(l) As soon thereafter as practicable, DOE will publish in the *Federal Register* a final rule to that effect. *Id.*

The waiver process also provides that DOE may grant an interim waiver if it appears likely that the underlying petition for waiver will be granted and/or if DOE determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the underlying petition for waiver. 10 CFR 430.27(e)(2). Within one year of issuance of an interim waiver, DOE will either: (i) publish in the *Federal Register* a determination on the

petition for waiver; or (ii) publish in the *Federal Register* a new or amended test procedure that addresses the issues presented in the waiver. 10 CFR 430.27(h)(2).

If DOE ultimately denies the petition for waiver DOE will provide a period of 180 days before the manufacturer is required to use the DOE test procedure to make representations of energy efficiency. 10 CFR 430.27(i). When DOE amends the test procedure to address the issues presented in a waiver, the waiver will automatically terminate on the date on which use of that test procedure is required to demonstrate compliance. 10 CFR 430.27(h)(3).

II. GEA's Petition for Waiver and Interim Waiver

On April 9, 2021, DOE received⁴ from GE Appliances, a Haier Company (“GEA”) a petition for waiver and interim waiver from the test procedure for MREFs set forth at appendix A to subpart B of 10 CFR part 430. (GEA, No. 1 at p. 1)⁵ Pursuant to 10 CFR 430.27(e)(i), DOE posted the petition on the DOE website at: www.regulations.gov/document/EERE-2021-BT-WAV-0009-0001.⁶

The specific basic model for which the petition applies is “S-IHG-R”, which was provided by GEA in its April 9, 2021 petition and is described by GEA as an “In-Home Grower”—a product with lighting, temperature, humidity, and nutrient water control which allows the user to grow plants within their home year-round. GEA stated that the average compartment temperatures of the In-Home Grower exceed the 55 °F standardized temperature required for testing under the existing DOE test procedure (see section 3 of Appendix A) and,

⁴ A petition submitted under 10 CFR 430.27 is considered “received” on the date it is received by DOE through DOE’s established e-mail box for receipt of waiver petitions or, if delivered by mail, on the date the waiver petition is stamped as received by the DOE. 10 CFR 430.27(e)(1)(iii).

⁵ A notation in this form provides a reference for information that is in the docket for this test procedure waiver (Docket No. EERE-2021-BT-WAV-0009) (available at www.regulations.gov/docket/EERE-2021-BT-WAV-0009). This notation indicates that the statement preceding the reference is document number 1 in the docket and appears at page 1 of that document.

⁶ The petition did not identify any of the information contained therein as confidential business information.

therefore, the product cannot be tested using the existing test procedure. GEA also noted characteristics of this basic model that GEA stated would prevent the use of certain test setup, stabilization, temperature control, and energy use determination requirements in Appendix A. (GEA, No. 1 at pp. 3-4)

In its April 9, 2021 petition, GEA submitted to DOE an alternate test procedure to determine the energy consumption of its In-Home Grower. (GEA, No. 1 at p. 6) GEA stated that its alternate test procedure would allow for the measurement of the energy use of this product where the requirements of the current DOE test procedure cannot be met. DOE received a follow-up correspondence from GEA on April 26, 2021, which provided a revised alternate test procedure.⁷ DOE reviewed the alternate test procedure included in the April 26, 2021 correspondence as the requested alternate test approach when making the initial determinations discussed in this document. GEA also provided additional correspondence on June 2, 2021, in which it clarified certain aspects of the proposed alternate test procedure included in the April 26, 2021 submission.⁸

GEA also requests an interim waiver from the existing DOE test procedure. DOE must review the petition for interim waiver within 45 business days of receipt of the petition. 10 CFR 430.27(e)(1)(ii). If DOE does not notify the applicant of the disposition of the petition for interim waiver, in writing, within 45 business days of receipt of the petition, the interim waiver is granted utilizing the alternate test procedure requested in the petition.⁹ *Id.* DOE will grant an interim waiver if it appears likely that the petition for waiver will be granted, and/or if DOE

⁷ This document can be found in the docket for this test procedure waiver under Document No. 002.

⁸ This document can be found in the docket for this test procedure waiver under Document No. 003.

⁹ The June 2, 2021 submission specified the energy use intended to be measured under the alternate test procedure suggested by GEA, thereby providing the information necessary for DOE to evaluate the representativeness of the suggested procedure. DOE considers June 2, 2021 to be the date on which GEA completed its submission to DOE, and DOE calculated the 45-day period as beginning on June 2, 2021.

determines that it would be desirable for public policy reasons to grant immediate relief pending a determination of the petition for waiver. 10 CFR 430.27(e)(2).

Based on GEA's description of the In-Home Grower, DOE has determined that the basic model meets the definition of a cooler in 10 CFR 430.2 for the following reasons:

1. The product consists of a cabinet used with one or more glass doors, as specified by GEA;
2. The product maintains compartment temperatures no lower than 39 °F, as determined when tested in a 90 °F ambient temperature, as GEA specified that the compartment temperatures measured 79.90 °F and 79.97 °F under these conditions at the minimum temperature setting.

The definition for cooler at 10 CFR 430.2 does not reference a specific design intent (such as storage of food or beverages) and does not require that the product be capable of maintaining a compartment temperature of 55 °F when tested in a 90 °F ambient temperature.

DOE understands, based upon GEA's petition, that absent an interim waiver, GEA's In-Home Grower cannot be tested and rated for energy consumption according to the MREF test procedure on a basis representative of its true energy consumption characteristics. However, as discussed in section III, DOE has tentatively determined that GEA's proposed alternative test procedure (as revised on April 26, 2021) would not result in a measurement of the energy use of this basic model that is representative of an average use cycle or period of use. Therefore, DOE has determined that GEA's waiver petition is unlikely to be granted as submitted and that it is not desirable for public policy reasons to grant GEA with the immediate relief it seeks. As a result, DOE is declining to grant an GEA an interim waiver for the subject basic model and is seeking additional information on the underlying basis for GEA's suggested alternative test procedure for the purpose of making a final determination on the underlying petition for waiver.

The following two sections discuss specific aspects of GEA's petition for waiver and interim waiver.

A. Requirements Sought to be Waived

GEA requested to waive the current test procedure, calculations, and accompanying conditions for testing coolers as specified in section 6.2.2 of Appendix A. The primary assertion of the petition is that the basic model for which the waiver was requested contains a design characteristic that prevents testing of the basic model according to the prescribed DOE MREF test procedure. GEA states that the In-Home Grower, when tested at its coldest setting in a 90 °F ambient temperature, cannot achieve the 55 °F standardized temperature required for the DOE MREF test procedure (see section 3 of Appendix A). GEA stated that its testing in a 90 °F ambient condition resulted in compartment temperatures of 79.90 °F and 79.97 °F.

The DOE test procedure at Appendix A simulates typical room conditions (72 °F) with door openings, by testing at 90 °F without door openings. 10 CFR 430.23(ff)(7). The test procedure directly measures the energy consumed during steady-state operation and defrosts, if applicable. Additionally, the DOE test procedure incorporates usage adjustment factors to account for differences in these user-related thermal loads for different types of consumer refrigeration products (*i.e.*, MREFs are typically used less frequently than a primary refrigerator-freezer in a household and thus have an adjustment factor of 0.55). See Appendix A, section 5.2.1.1.

GEA states that there is no need to elevate the ambient temperature for the test to account for door openings and loads because the In-Home Grower has a very low number of door

openings and, after the initial loading with plants, will typically not have additional loads introduced.

As stated, the existing test procedure for MREFs contains a method for addressing certain types of products for which less frequent door openings occur. Specifically, the test procedure applies an adjustment factor to account for the relatively fewer expected door openings. See Appendix A, section 5.2.1.1. The adjustment factor does not address the potential inability of an MREF to maintain a 55 °F compartment temperature at a 90 °F ambient condition.

GEA seeks to waive the requirement for testing the In-Home Grower at a 90 °F ambient condition. See Appendix A section 2.1.1. GEA instead requests to test the In-Home Grower in a 72 °F ambient condition, which it asserts better represents typical use of the product. GEA further stated that testing at a 72 °F ambient with the product temperature set to 60 °F (the minimum temperature set point) yielded compartment temperatures between 59.15 and 61.41 °F. As the In-home Grower is not capable of maintaining the 55 °F standardized compartment temperature specified in Appendix A, GEA also seeks to waive the requirement in section 6.2.2 of Appendix A that performance be calculated at a standardized compartment temperature of 55 °F. Instead, GEA requests that the model be tested in the 72 °F ambient condition using default settings.

Additionally, GEA seeks to waive the existing DOE test procedure requirement to measure the internal compartment temperatures of the unit under test. See Appendix A, section 5.1. GEA claims that the rotation of the compartments significantly increases the test burden of temperature measurements, as the thermocouple wires would require a customized testing setup to avoid tangling of the wires and movement of the temperature masses. Under GEA's requested approach, compartment temperature measurements would not be necessary because no

interpolation would be made to reflect performance at the standardized 55 °F compartment temperature because the In-Home Grower cannot achieve a 55 °F compartment temperature at its lowest temperature setting.

GEA also seeks to waive the stabilization and test period requirements specified in sections 2.9 and 4 of Appendix A, respectively. Specifically, GEA requests an 8-hour stabilization period (the duration of each rotation) and 24-hour test period (the duration of one full rotation) based on the rotation of the internal compartments rather than based on compressor cycling as specified in Appendix A.

B. Requested Alternate Test Procedure

GEA seeks to use an alternate test procedure to test and rate a specific MREF basic model. GEA's requested alternate test procedure addresses the test procedure requirements to be waived as discussed in the previous section of this document. GEA's requested approach also includes additional test instructions regarding isolating refrigeration system energy use and additional setup and settings instructions.

GEA requests that two tests be conducted, one with the model operating as normal and another with the refrigeration system disabled to allow for identifying the cooling system's energy contribution. In its April 26, 2021 submission, GEA stated that the main purpose of the cooling system is to counteract the heat from the lighting and that the proposed revised test procedure would be used to determine the energy consumption of the cooling system only. In the June 2, 2021 correspondence, GEA further asserted that the existing MREF test procedure does not anticipate or account for any product that has a purpose other than chilling the contents below ambient temperature, so there was no need for the existing test procedure to account for products that have significant other functions and that consume energy to provide those

functions. GEA claimed that the In-Home Grower is distinctly different from all other MREFs in that its intended purpose (growing plants), its primary function (providing light and appropriate water and humidity), and the purpose for its sealed system (removing heat generated by those process, generally to ambient temperature) are all distinct from all other MREFs (chilling items placed in the cabinet to below ambient temperature). GEA stated that the revised proposed alternate test procedure accounts for these differences while honoring the intent of the existing test procedure (as it applies to all other MREFs) to measure the energy used by the refrigeration system.

GEA further claimed that the exclusion of energy other than that used by the refrigeration system is consistent with section 2.2 of the Appendix A (which incorporates by reference portions of AHAM HRF-1-2008). GEA stated that under this provision, product features not required for normal operation of the refrigeration system are to be set to their lowest energy setting during testing, and that this is what allows, for instance, refrigerators with large-format touchscreen computers integrated into the product to be tested with those computers (and their large screens) turned off. GEA asserted that similar logic applies to testing only the refrigeration portion of the In-Home Grower.

Because the In-Home Grower supplies water and nutrients to plants during normal operation, GEA's suggested alternate test procedure also provides instructions for filling nutrient tanks with water prior to the start of the test. As requested, water at the proposed ambient temperature would be supplied to the nutrient tanks.

The proposed alternate test approach also provides instructions for product settings, as the suggested test procedure would not be based on the product maintaining compartment temperature to the 55 °F standardized compartment temperature specified in Appendix A.

Specifically, GEA requests that the In-Home Grower be controlled via use of an application on a connected device and that the product be operated using default settings.

In summary, GEA's suggested alternate test procedure provides a method for measuring the test cycle energy of the vapor compression system only, as follows;¹⁰

- (1) two tests, one with the basic model operating as normal and one with the basic model operating with the refrigeration system disabled, and a calculation of daily energy consumption of the vapor compression refrigeration system based on the difference between these two tests;
- (2) directions for filling the nutrient water tanks with water at ambient temperature;
- (3) a specific stabilization period of 8 hours (in place of the requirements of section 2.9 of Appendix A);
- (4) a specific test period of 24 hours (in place of the test period described in section 4.1 of Appendix A);
- (5) an alternative ambient test condition of 72 °F (in place of the requirement in section 2.1.1 of Appendix A);
- (6) that no compartment temperature measurements be taken during the test (in place of the requirements in section 5.1 of Appendix A); and
- (7) that the product be controlled using an application from a connected device and operated using default settings. (GEA, No. 2 at p. 6)

III. Denial of Interim Waiver and Request for Comments

DOE has reviewed GEA's petition for an interim waiver and the alternate test procedure requested by GEA. Based on this review, DOE is denying GEA's April 26, 2021 petition for an

¹⁰ The summary of the proposed alternate test procedure printed in this section is consistent with that included in GEA's April 26, 2021 message to DOE. The original proposed alternate test procedure is appended to this notice, along with GEA's original April 9, 2021 petition.

interim waiver, which incorporates elements from GEA's April 9, 2021 submission. In its April 9, 2021 submission, GEA stated that its petition for waiver is likely to be granted, as the suggested alternate test procedure accurately measures the energy consumed by the subject basic model based on its design and intended use, which GEA stated is consistent with the goals of the DOE appliance standards program and the test procedure requirements this application seeks to waive.

DOE has tentatively determined that the requested alternate test procedure would not result in measured energy use of the basic model that is representative of actual energy used during representative average use. Specifically, DOE has determined that the requested test approach to isolate the refrigeration system energy consumption does not provide a representative measurement of energy use for this basic model during an average use cycle or period of use. Therefore, DOE is denying GEA's petition for an interim waiver.

As discussed, GEA stated that the In-Home Grower's primary function is to provide light and appropriate water and humidity for plant growing, and that the purpose of its sealed system is to remove heat generated by those process. (GEA, No. 3 at p. 1) However, the requested alternate test procedure would determine the energy consumption of only the cooling function of the product without accounting for the energy consumption of the primary function of the product. During average use, the energy consumed by the subject basic model would include the refrigeration system energy use plus the energy consumed by any other components active during normal operation (*e.g.*, lighting, fans, controls, *etc.*).

In contrast to GEA's assertion, DOE's test procedure is not intended to measure only the cooling function of consumer refrigeration products. The test procedure measures the electrical energy consumption of the overall product, including any components not included in the

refrigeration system. For example, DOE stated in an April 21, 2014 final rule that the DOE test procedures for refrigeration products measure the energy use of these products during extended time periods that include periods when the compressor and other key components are cycled off and that the energy use of these products during the compressor off cycle is included in the measurements. 79 FR 22320, 22345 (April 21, 2014).

As stated by GEA, Appendix A, by referencing AHAM HRF-1-2008 section 5.5.2(g), provides instructions for test settings. GEA stated that its proposed test approach to exclude energy other than that used by the refrigeration system is consistent with the AHAM HRF-1-2008 requirements. However, section 5.5.2(g) of AHAM HRF-1-2008 specifies that customer accessible features not required for normal operation, which are electrically-powered, manually-initiated, and manually-terminated, shall be set at their lowest energy usage positions when adjustment is provided. This provision does not isolate refrigeration system energy use, but rather limits (or excludes) energy consumption of customer accessible features not required for normal operation of the refrigeration product. What is considered “normal operation” is not defined in HRF-1-2008 or in Appendix A. In the case of the GEA In-Home Grower, GEA stated that the model’s intended purpose is growing plants, its primary function is providing light and appropriate water and humidity, and the purpose for its sealed system is to remove heat generated by those process, generally to ambient temperature. (GEA, No. 3 at p. 1) Therefore, DOE has tentatively determined that “normal operation” for this basic model includes functions beyond operation of the refrigeration system, and that testing should account for the energy consumed by such functions.

Because GEA’s proposed alternate test procedure would not account for lighting energy use (a primary function of the basic model), or the energy use of other components required for normal operation (*e.g.*, the motor rotating the internal tower and product controls), DOE has

tentatively determined that the requested alternate test procedure would not provide a representative measure of energy use of the In-Home Grower during an average use cycle or period of use. Therefore, DOE is denying GEA's petition for an interim waiver.

While DOE declines to approve the use of GEA's suggested alternate test procedure in an interim waiver at this time, DOE may consider including this alternate procedure, or a modified version of this alternate procedure, in a subsequent Decision and Order. DOE solicits comments from interested parties on all aspects of the petition, including the suggested alternate test procedure and calculation methodology.

Signing Authority

This document of the Department of Energy was signed on June 29, 2021, by Kelly Speakes-Backman, Principal Deputy Assistant Secretary and Acting Assistant Secretary for Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC, on June 30, 2021.

Treena V. Garrett,
Federal Register Liaison Officer,
U.S. Department of Energy.

Appendix 1 – Petition for Waiver & Application for Interim Waiver Regarding Test Procedure for Measuring the Energy Consumption of Refrigerators, Refrigerator-Freezers, and Miscellaneous Refrigeration Products

GE Appliances, a Haier company (GEA) respectfully submits this Petition for Waiver and Application for Interim Waiver from the Department of Energy (DOE) test procedure for Miscellaneous Refrigeration Products in 10 CFR 430 Subpart B, Appendix A. GEA's request is for a new product that allows users to grow plants within their home the entire year. The product is designed to be used in an *[sic]* indoor, temperature-controlled environment with room temperatures from 60 °F to 80 °F. The appliance provides the lighting, temperature and humidity control, and nutrient water to grow an array of plants. The average compartment temperatures of the appliance exceed the 55 °F standardized temperature for the existing DOE miscellaneous refrigeration products test procedures. The product, therefore, cannot be tested using the existing test procedure.

1. About GE Appliances

GEA is a leading US manufacturer of home appliances. GEA offers a full suite of major appliances across seven brands as well as portable appliances. GEA has been a participant in and contributor to the DOE's home appliance energy conservation program since its founding more than 40 years ago. Indeed, GEA supports the goal of the appliance efficiency program: maximizing energy savings improvements that offer consumers real economic benefits and that do not diminish product performance. GEA devotes substantial resources to the development of new technologies to increase energy efficiency where they are feasible and engineering products to meet the demanding DOE energy efficiency requirements. GEA manufactures a substantial portion of its refrigerator products at its manufacturing facilities in Louisville, KY, Decatur, AL, and Selmer, TN. The products covered by this waiver request will be manufactured in the United States.

2. Basic Models for Which a Waiver is Requested

This Petition for Waiver and Application for Interim Waiver covers the "In-Home Grower". There is no existing Product Class for this type of appliance. The Basic Model is S-IHG-R. The basic model will be distributed in commerce under the brand name "Profile".

The In-Home Grower allows the user to grow plants within their home year-round. The appliance provides the lighting, temperature and humidity control and nutrient water needed to grow an array of plants. The product is designed to be in a controlled environment with room temperature from 60 to 80 °F.

The appliance has a circular grow tower that is in the center of the product. The tower is divided into three equal-sized vertical sections, each comprising 1/3rd of a circular cross section (see Figure 1 below).¹¹

On each of the three sides of the tower are gardens. In addition to the three sections of the tower, there are three chambers within the product cabinet. The dividers of the three chambers meet up with the walls of the three cabinet sections to create three distinct and individually controlled compartments within the product. There are seals on the center tower walls to ensure that the

¹¹ Product images provided with petition may be found at Docket No. EERE-2021-BT-WAV-0009 at www.regulations.gov/docket/EERE-2021-BT-WAV-0009.

environment in each chamber remains separate. This tower rotates every eight hours. Each time the tower rotates, a section of the tower enters a new chamber.

The front chamber is called the display chamber. This is the side of the garden the customer will see through the front glass doors. In the display chamber, there is no grow lighting, temperature controls, or humidity controls.

The back right and back left chambers are individually controlled for grow lighting, temperature, and humidity.

3. Design Characteristic Constituting Grounds for the Petition

- a. The appliance, at its coldest setting in a 90 °F ambient, cannot achieve the 55 °F reference temperature necessary for the DOE MREF test procedure. The procedure therefore cannot be used for this appliance.
- b. There is no need to test at an elevated ambient to account for door openings and loading as is the case with the current DOE miscellaneous refrigeration products test procedures. This is true for the following reasons.
 - i. The basic model listed operates at an ambient between 60 °F and 80 °F.
 - ii. Once loaded with plants, there are a minimal amount of door openings as the product is intended to grow the plants until they are grown and ready for use.
 - iii. Since the internal temperatures are closer to the ambient temperature, any door openings that did occur would only result in minimal heat addition to the interior.
 - iv. The chambers that have the temperature and humidity control are not accessible by the door and are sealed to prevent any air exchange with the front display chamber.
 - v. The appliance has rotating compartments which make taking internal temperature measurements burdensome if not impossible. Thermocouple wires for refrigeration tests run from inside the unit under test to a panel box affixed to a wall. The internal compartments of the In-Home Grower rotate during operation. Unique fixtures and test setup would be required in order to avoid tangling of the wires, movement of the thermocouple, or pulling the wires out of the panel box.
- c. At the product's coldest setting in a 90 °F ambient, the internal compartment temperature does not reach the reference temperature of 55 °F for a miscellaneous refrigeration product. Per Table 1 in 10 CFR 430 Subpart B, Appendix A, 3.2.1.3, "No Energy Use Rating can be established under the existing test procedure". Therefore, interpolation to 55 °F is not possible, and the existing DOE interpolation method cannot be used to establish a test result.

4. Requirements Sought to be Waived

GEA seeks to replace the current test procedure in Appendix A for Coolers, 6.2.2, with the accompanying test conditions specified in Exhibit A, below, for the In-Home Grower appliance.

Instead of a 90 °F ambient, GEA has specified a 70 °F ambient for the testing. This is representative of customer usage as the product is designed to be placed in an indoor, conditioned space with an ambient between 60 and 80 °F. Also, as stated above, there is no need to elevate the ambient for the test to account for door openings and loads as the appliance has a very low number of door openings and, after the initial loading with plants, will typically not have additional loads introduced.

The proposed test procedure does not have temperature measurements. Based on internal testing in a 90 F environment, the internal temperatures of the two controlled compartment [*sic*], at its coldest setting were 79.90 °F and 79.97 °F, well above the 55 °F reference temperature of the DOE MREF test procedure. Also, the rotation of the compartments significantly increases the test burden of temperature measurements as the thermocouple wires would have to have a setup to avoid tangling of the wires and movement of the temperature masses.

This appliance has no defrosting capabilities and can be tested similarly to a non-automatic defrost. In order to capture a complete cycling of the growing chambers, GEA is proposing a test that has an 8-hour stabilization period followed by a 24-hour test period. The growing chambers rotate 120° every 8 hours. This comprises one rotation for stability and three rotations for the test period.

5. Manufacturers of All Other Basic Models with Similar Design Characteristics

To GEA's knowledge, there are no products of this type in the marketplace.

6. The Application for Interim Waiver Should Be Granted

a. The Petition for Waiver Will Likely be Successful

This Petition for Waiver is likely to be granted as the proposed alternative test procedure accurately measures the energy consumed by this novel product based on its design and intended use, all of which is consistent with the goals of the DOE appliance standards program and the test procedure requirements this application seeks to waive.

b. Failure to Provide an Interim Waiver Will Cause Economic Hardship and Competitive Disadvantage

If DOE does not promptly grant an interim waiver, GEA will likely be unable to test and certify this model within a commercially reasonable time. Such delay will prevent GEA from offering the product in a manner most likely to lead to its commercial success and will prevent or delay GEA from expanding its US manufacturing workforce.

7. Notice to Other Manufacturers

Pursuant to 10 CFR 430.27(c), upon publication of a grant of interim waiver, GEA will notify in writing all known manufacturers of domestically marketed basic models of the same product class (as specified in 10 CFR 430.32) and of other product classes known to the petitioner to use the technology or have the characteristic at issue in the waiver. The notice will include a statement that DOE has published the interim waiver and petition for waiver in the Federal Register and the date the petition for waiver was published. The notice will also include a statement that DOE will receive and consider timely written comments on the petition for waiver. Within five working days of publication of the grant of interim waiver, GEA will file

with DOE a statement certifying the names and addresses of each person to whom a notice of the petition for waiver was sent.

8. Conclusion

GEA respectfully requests that DOE grant this Petition for Waiver and Application for Interim Waiver from the current test procedure for the specified basic models.

Very truly yours,

Signed by: /s/ Bill A. Brown, P.E.
[Date: April 8, 2021]

Attachments:

Exhibit A – Alternate Test Procedure

Exhibit A: Alternate Test Procedure for In-Home Grower Miscellaneous Refrigeration Product

Energy Consumption is Determined by the Formula: $E = EP * 1440 / T$ where:

- E is the test cycle energy (kWh/day)
- 1440 = number of minutes in a day
- EP is the energy expended during three full rotations of the growing chambers (kWh)
- T is the length of time for EP (minutes)

Water in Tanks:

Fill nutrient tanks with water (70.0 ± 5.0 °F) prior to start of the stabilization period.

Stabilization:

The test shall start after a minimum 8 hours stabilization run for each temperature control setting. This constitutes one rotation of the growing chambers.

Ambient Temperature:

Measure and record the ambient temperature at points located 3 feet (91.5 cm) above the floor and 10 inches (25.4 cm) from the center of the two sides of the unit under test. The ambient temperature shall be 70.0 ± 1 °F (21.1 ± 0.6 °C) during the stabilization period and the test period.

Temperature Measurements:

No compartment temperature measurements are taken during the test.

Test Procedure:

Run the test using the SmartHQ App

1. Download the SmartHQ app on a connected device
2. Select “Connect Appliance” and then “In Home Grower”
3. Follow the procedures per the SmartHQ app to set up the appliance.
4. Fill the nutrient tanks with 70.0 ± 5.0 °F water.
5. Select “Let’s Start Planting” from the main screen.
6. Select Garden 1 from the “Select Garden” screen

- a. Select the “Default” growing region.
 - b. Select “Next” at the bottom of the screen
7. At the screen titled “What do you want to plant in Garden x?”, select “Choose Later”
8. Repeat this process for Garden 2 and Garden 3.
9. Select “Start the Growing Cycle”
10. The first rotation (8 hours) is the stabilization period.
11. The next three rotations (24 hours) is the period where EP and T data are taken.

Appendix 2 – April 26, 2021: Response to DOE Questions for GEA Petition for Waiver

GE Appliances, a Haier company (GEA) respectfully submits the below answers to the DOE’s questions contained *[sic]* in your email of April 16, 2021. Additionally, GEA has modified the proposed test procedure to address the comments and questions raised by DOE and to account for only the sealed system energy use, which is consistent with the provisions of 10 CFR 430.23 (ff) and 10 CFR 430 Subpart B, Appendix A. The revised procedure is found in Exhibit A of this document, which is submitted as a substitution for Exhibit A in the initial submission.

1. Model Description

- a. What is the cooling system employed (i.e., vapor compression, thermoelectric, evaporative, or something else)?

GEA Response: Vapor compression

- b. Is there a way the rotation function can be disabled via user-accessible settings/controls?

GEA Response: No

- c. Does the unit connect using peer-to-peer wireless technology (e.g. WiFi Direct or Bluetooth) or does it require a LAN?

GEA Response: WiFi. The product connects to a router in the user’s home.

2. Test Method

- a. Is the 70°F ambient condition most representative of actual use? DOE’s cooler test procedure is intended to simulate typical room conditions (72 °F (22.2 °C)) with door openings, by testing at 90 °F (32.2 °C) without door openings. 430.23(ff)(7). Recommend a 72°F test condition for consistency with the intent of DOE’s test procedure.

GEA Response: Testing at a 72 °F ambient is acceptable. A revised test procedure making this change is included in Exhibit A.

- b. Can the model maintain 55°F compartment temperature when operated in a 72°F ambient condition?

GEA Response: No. There are temperature sensors in the two compartments that maintain the user-selected set points. The product allows the user to select between 60 °F and 80 °F for the compartment temperatures. Temperatures below 60 °F are not conducive for growing plants. GEA’s testing at a 72 °F ambient with the product temperature set to 60 °F yielded compartment temperatures between 59.15 and 61.41 °F.

- c. If the rotation is disabled, can thermocouples be placed inside the refrigerated space while it operates, and would the refrigerated compartments achieve temperatures lower than during operation with the rotation active?

GEA Response: Disabling rotation is not an intended operation of the unit and is not an available option to the user. Disabling rotation of the unit is not capable of

being implemented by a test lab without physical modification of the unit. Temperatures in the compartments will stabilize at the user-selected set point regardless whether the chambers are rotating, but the unit will use less energy than it would if the units are rotating as the front chamber is not conditioned.

Can thermocouples be placed in the corners of the refrigerated compartments and avoid any rotating components?

GEA Response: Thermocouples cannot be placed in the corners of the temperature-controlled compartments and avoid rotating components. The back corners are not in the controlled space. They are used for wire and tubing routing and circuit board placements. See the top view picture below. The grow tower comes very close to the circular liners, similar to the operation of a revolving door. There is not enough of a gap to allow TCs to be placed and not cause an interference.

[Product Image Included]

d. Is the SmartHQ app the only method of controlling the unit? Are there any digital controls on the unit itself?

GEA Response: There are limited controls on the unit (see attached picture). The In-Home Grower will not function without being connected to Wifi.

[Control Panel Image Included]

- The “Rotate” buttons on the User Interface (UI) allow the user to rotate the tower 120 degrees either clockwise or counterclockwise.
- “Control Lock” prevents the buttons on the UI from being used.
- “WiFi Connect” is used for connecting the unit to the user’s wireless network

Are control settings available (either on the unit or through the SmartHQ app) to adjust operating temperature, lighting, and humidity?

GEA Response: There are two modes the user can operate the unit:

Mode 1: The user can select a growing region (based on the types of seeds they want to plant). In this mode, lighting, temperature, and humidity settings are controlled by the product. The user cannot modify any settings. They can only change the growing region.

Mode 2: The user can select “Advanced Mode”. In this mode, the user has full control over the all settings within limited ranges set by the product (e.g., temperature can only be selected within the 60 °F to 80 °F range). The user can choose to turn lighting completely off. In both modes, the settings can be specified for each of the three gardens (each garden can have its own settings).

e. Does the lighting contribute to a significant thermal load for the cooling system to counteract?

GEA Response: Yes. The main purpose of the cooling system is to counteract the heat from the lighting.

Do any additional control settings needed to be specified for testing (e.g. lighting, humidity controls)?

GEA Response. The proposed, revised test procedure is used to determine the energy consumption of the cooling portion of the product. There are two portions to the test: One with lighting and cooling active, and the second with the lighting active and cooling disabled. This allows for a direct measurement of the cooling system's energy contribution.

f. Is the intent for the test be conducted using a single test at the lowest control temperature setting? Exhibit A refers to "each temperature control setting" in the stabilization section.

GEA Response: The proposed test procedure has been modified to state that the test is only at one control setting, the default setting of the product. The original language was extraneous as the test is run using only one control setting.

If conducting multiple temperature setting tests, how would the interpolation to 55F occur with no compartment temperature measurements?

GEA Response. The energy result from the test will be derived from two tests at the default setting, as described previously. Interpolation to 55 °F is not possible with this product as it does not achieve temperatures below 55 °F at its coldest setting.

Very truly yours,

Signed by: /s/ Bill A. Brown, P.E.
[Date: April 26, 2021]

Technical Director
GE Appliances, a Haier company

Attachments: Exhibit A – Revised Alternate Test Procedure

EXHIBIT A (revised 4/26/2021)

Alternate Test Procedure for In-Home Grower Miscellaneous Refrigeration Product Energy Consumption is Determined by the Formula: $E = E1 - E2$

- E is the test cycle energy of the vapor compression system (kWh/day)
- E1 is the test cycle energy of the appliance with the lights and vapor compression system active (kWh/day)
 - o $E1 = (1440 * EP1) / T1$
 - o 1440 = number of minutes in a day
 - o EP1 is the energy expended during three full rotations of the growing chambers (kWh) with the lights and vapor compression system active.
 - o T1 is the length of time for the EP1 measurement (minutes)
- E2 is the test cycle energy of the appliance with the lights active and vapor compression system inactive (kWh/day)
 - o $E2 = (1440 * EP2) / T2$
 - o 1440 = number of minutes in a day
 - o EP2 is the energy expended during three full rotations of the growing chambers (kWh) with the lights active and the vapor compression system inactive.
 - o T2 is the length of time for the EP2 measurement (minutes)

Water in Tanks:

Fill nutrient tanks with water (72.0 ± 5.0 °F) prior to start of the stabilization period.

Stabilization:

The test shall start after a minimum 8 hours stabilization run for the default setting of the appliance. This constitutes one rotation of the growing chambers.

Ambient Temperature:

Measure and record the ambient temperature at points located 3 feet (91.5 cm) above the floor and 10 inches (25.4 cm) from the center of the two sides of the unit under test. The ambient temperature shall be 72.0 ± 1 °F (22.2 ± 0.6 °C) during the stabilization period and the test period.

Temperature Measurements:

No compartment temperature measurements are taken during the test.

Test Procedure:

Run the test using the SmartHQ App

1. Download the SmartHQ app on a connected device
2. Select “Connect Appliance” and then “In Home Grower”
3. Follow the procedures per the SmartHQ app to set up the appliance.
4. Fill the nutrient tanks with 72.0 ± 5.0 °F (22.2 ± 2.8 °C) water.
5. Select “Let’s Start Planting” from the main screen.
6. Select Garden 1 from the “Select Garden” screen
 - a. Select the “Default” growing region.
 - b. Select “Next” at the bottom of the screen
7. At the screen titled “What do you want to plant in Garden x?”, select “Choose Later”
8. Repeat this process for Garden 2 and Garden 3.
9. Select “Start the Growing Cycle”
10. The first rotation (8 hours) is the stabilization period.
11. The next three rotations (24 hours) is the period where EP1 and T1 data are taken.
12. Disconnect the compressor harness. Instructions to be provided when product is tested by a third-party.
13. The first rotation (8 hours) is the stabilization period
14. The next three rotations (24 hours) is the period where EP2 and T2 data are taken.